Electric Vehicles

Owner's Manual and Service Guide

Star EV M-Series

8, 11, 14, and 23-Passenger Buses

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This manual has been designed to assist in maintaining the vehicle in accordance with procedures developed by the manufacturer. Adherence to these procedures and troubleshooting tips will ensure the best possible service from the product. To reduce the chance of personal injury or property damage, the following must be carefully observed.

General Safety

Good common sense and prudent driving practices do more to prevent accidents and injury than all of the warnings and instructions combined. The manufacturer strongly suggests that all users and maintenance personnel read this entire manual paying particular attention to the CAUTIONS and WARNINGS contained therein.

Star EV reserves the right to make design changes without obligation to make these changes on units previously sold and the information contained in this manual is subject to change without notice.

Star EV is not liable for errors in this manual or for incidental or consequential or consequential damages that result from the use of the material in this manual.

These vehicles are designed and manufactured for off-road use. Some communities may permit these vehicles to be operated on their streets on a limited basis and in accordance with local ordinances.

With electric powered vehicles, be sure that all electrical accessories are grounded directly to the battery (-) post. **Never use the chassis or body as a ground connection.**

Refer to *Vehicle Specifications* for vehicle seating capacity.

Never modify the vehicle in any way that will alter the weight distribution of the vehicle, decrease its stability or increase the speed beyond the factory specification. Such modifications can cause serious personal injury or death.

Vehicles that are capable of higher speeds must limit their speed to no more than the speed of other vehicles. Additionally, speed should be further moderated by the environmental conditions, terrain and common sense.

General Operation

Always:

- Use the vehicle in a responsible manner and maintain the vehicle in safe operating condition.
- Read and observe all warnings and operation instruction labels affixed to the vehicle.
- Follow all safety rules established in the area where the vehicle is being operated.
- Reduce speed to compensate for poor terrain or conditions.
- Apply service brake to control speed on steep grades.
- Maintain adequate distance between vehicles.
- Reduce speed in wet areas.
- Use extreme caution when approaching sharp or blind turns.
- Use extreme caution when driving over loose terrain.
- Use extreme caution in areas where pedestrians are present.

Maintenance

Always:

- Maintain the vehicle in accordance with the manufacturer's periodic service schedule.
- Ensure that repairs are performed by those that are trained and qualified to do so.
- Follow the manufacturer's maintenance procedures for the vehicle. Be sure to disable the vehicle before performing any maintenance. Disabling includes removing the key from the key switch and removal of a battery wire.
- Insulate any tools used within the battery area in order to prevent sparks or battery explosion caused by shorting the battery terminals or associated wiring. Remove the batteries or cover exposed terminals with an insulating material.
- Check the polarity of each battery terminal and be sure to rewire the batteries correctly.
- Use specified replacement parts. Never use replacement parts of lesser quality.
- Use recommended tools.
- Determine that tools and procedures not specifically recommended by the manufacturer will not compromise the safety of personnel nor jeopardize the safe operation of the vehicle.
- Support the vehicle using wheel chocks and jack stands. Never get under a vehicle that is supported by a jack. Lift the vehicle in accordance with the manufacturer's instructions.
- Maintain the vehicle in an area away from exposed flame or persons who are smoking.
- Be aware that a vehicle that is not performing as designed is a potential hazard and must not be operated.

- Test-drive the vehicle after any repairs or maintenance. All tests must be conducted in a safe area that is free of both vehicular and pedestrian traffic.
- Replace damaged or missing warning, caution or information labels.
- Keep complete records of the maintenance history of the vehicle.
- Use extreme caution and, if unsure as to the potential for injury, refer the repair or maintenance to a qualified mechanic.

For the User

General Safety Practices

Like other machines, this vehicle can cause injury if improperly used or maintained. This section contains broad safety practices applicable to vehicle operations. Before operation, the user should establish such additional specific safety practices as may reasonably be required for safe operation.

Nameplates, Markings, Capacity, and Modifications

The user should maintain in a legible condition all nameplates, warnings and instructions which are supplied by the manufacturer.

The user should not perform any modification or addition which affects capacity or safe operation of the vehicle, or make any change not in accordance with the owner's manual without the manufacturer's prior written authorization. Where authorized modifications have been made, the user should ensure that capacity, operation, warning and maintenance instruction plates, tags or decals are changed accordingly.

Changing and Charging Storage Batteries for Electric Personnel and Burden Carriers

The user should require battery changing and charging facilities and procedures to be in accordance with appropriate paragraphs of ANSI/NFPA 505.

The user should periodically inspect facilities and review procedures to be certain that appropriate paragraphs of ANSI/NFPA 505, are strictly complied with and should familiarize carrier operators with it.

General Safety Rule and Practices

Safeguard pedestrians at all times. Do not drive cart in a manner that would endanger anyone.

Riding on the cart by persons other than the operator is authorized only on personnel seat provided by the manufacturer.

When a cart is to be left unattended, stop it, apply the parking brake, stop the engine or turn off power, turn off the control or ignition circuit, and remove the key if provided. Block the wheels if machine is on an incline.

Use only approved carts in hazardous locations, as defined in the appropriate safety standards.

Operators should not add to, or modify, the cart.

Traveling

Observe all traffic regulations, including authorized speed limits. Under normal traffic conditions keep to the right. Maintain a safe distance, based on speed of travel, from a vehicle ahead; and keep the Cart under control at all times.

Do not pass another vehicle traveling in the same direction at intersections, blind spots, or at other dangerous locations.

Keep a clear view of the path of travel, observe other traffic and personnel, and maintain a safe clearance.

Slow down or stop, as conditions dictate, and activate the sound-producing warning device at cross aisles and when visibility is obstructed at other locations.

Ascend or descend grades slowly.

Under all travel conditions the cart should be operated at a speed that will permit it to be brought to a stop in a safe manner.

Do not indulge in dangerous activities, such as stunt driving or horseplay.

Avoid running over loose objects, potholes, and bumps.

To negotiate turns, reduce speed to improve stability, then turn hand steering wheel or tiller in a smooth, sweeping motion.

Loading

At the beginning of each shift during which the cart will be used, the operator should check the cart condition and inspect the tires, warning devices, lights, battery, speed and directional controllers, brakes, and steering mechanism. If the cart is found to be in need of repair or in any way unsafe, the matter should be reported immediately to the designated authority and the cart should not be operated until it has been restored to proper operating condition.

Do not make repairs or adjustments unless specifically authorized to do so.

Do not operate a cart with a leak in the battery.

Do not use open flames for checking electrolyte level in storage battery.

Maintenance Procedures

Carriers may become hazardous if maintenance is neglected. Therefore, maintenance facilities trained personnel, and procedures should be providing such facilities may be on or off the premises.

Maintenance and inspection of all carts should be performed in conformance with the manufacturer's recommendations and the following practices.

- A scheduled preventive maintenance, lubrication, and inspection system should be followed.
- Only qualified and authorized personnel should be permitted to maintain, repair, adjust, and inspect carriers.
- Block chassis before working underneath it.
- Operations to check performance of the cart should be conducted in an authorized area where safe clearance exists.
- Before commencing operation of the cart, follow the manufacturer's instructions and recommended procedures.
- Avoid fire hazards and have fire protection equipment present in the work area. Do not use an open flame to check level or leakage of battery electrolyte.
- Properly ventilate the work area.

- Brakes, steering mechanisms, speed and directional control mechanisms, warning devices, lights, guards, and safety devices should be inspected regularly and maintained in a safe operating condition.
- Special cart or devices designed and approved for hazardous area operation should be inspected to ensure that maintenance preserves the original approved safe operating features.
- Carriers should be kept in a clean condition to minimize fire hazards and facilitate detection of loose or defective parts.
- Modification and additions which affect capacity and safe machine operation should not be performed by the customer or user without manufacturer's prior written authorization; where authorized modifications have been made, the user should ensure that capacity, operation, warning, and maintenance instruction plates, tags, or decals are changed accordingly.
- Care should be taken to ensure that all replacement parts are interchangeable with the original parts and of a quality at least equal to that provided in the original equipment.

Maintenance Operations

Like other machines, this vehicle can cause injury if improperly used or maintained. This section contains broad safety practices recommended for safe vehicle operations. Before operation, the controlling party should establish such additional specific safety practices as may be reasonably required for safe operations.

Experience has shown that vehicles which comply with the provisions stated are safe when properly operated in accordance with the safety and operation.

This safety information is intended to provide the controlling party with basic safety information and to encourage the controlling party to implement a vehicle safety program.

It is suggested and recommended this section be reprinted in the vehicle manufacturer's operation and service manuals to encourage safe operations and practices at the controlling party's facility.

Safety Survey

The controlling party should perform a safety survey periodically, and as conditions warrant to their premises, to identify areas where the vehicle should not be operated and to identify possible hazards.

Wet and Loose Terrain

Wet grassy areas and loose terrain may cause a vehicle to lose traction and may affect stability. Wet areas and loose terrain should be chained or roped off to prevent vehicle operations or be identified by a suitable warning not to operate the vehicle in this area due to wet and loose terrain.

Sharp Turns, Blind Corners, Bridge Approaches

Sharp turns, blind spots, bridge approaches and other potentially hazardous areas should be either chained or roped off to prevent vehicle operations or identified with a suitable warning to the operator of the nature of the hazard and stating the proper precautions to be taken to avoid the hazard.

Vehicle /Pedestrian Interference Areas

Areas where pedestrians and the vehicle interfere should be avoided whenever possible by rerouting the vehicle traffic or the pedestrian traffic to eliminate the interference. If elimination of the interference is not possible or is highly impractical, signs should be erected warning pedestrians of the vehicle traffic and vehicle operators of the pedestrian traffic and to drive slowly and use extreme caution.

Preventative Maintenance

The vehicle may become hazardous if maintenance is neglected or improperly performed. Therefore maintenance facilities, trained personnel and procedures in accordance with the manufacturer's recommendations should be provided by the controlling party.

A regularly scheduled inspection and preventive maintenance program in accordance with the manufacturer's recommendations should be established. Such a program will be a valuable tool in providing the golfing patron with a safe, properly operating the vehicle and thereby help to avoid accidents.

Only qualified, trained and authorized personnel should be permitted to inspect, adjust and maintain resort vehicle.

Only manufacturer's recommended replacement parts and materials should be used.

Maintenance Safety Procedures

All maintenance should be performed in accordance with the manufacturer's recommended safety procedures as outlined in the manufacturer's operation and service manuals. The following list of recommended safety procedures are general in nature and in no way supersede the manufacturer's specific instructions.

Follow manufacturer's instructions for immobilizing the vehicle before beginning any maintenance. Block chassis before working underneath the vehicle.

Maintenance and storage areas should be properly ventilated to avoid fire hazards in accordance with applicable fire codes and ordinances.

Before performing any maintenance on an electric vehicle, disable the electrical system in accordance with the manufacturer's instructions.

Use only properly insulated tools when working on electrically powered vehicle or around batteries.

The controlling party should not perform any modification or addition which affects capacity or safe operation, or make any change not in accordance with owner's manual without the manufacturer's prior written authorization. Where authorized modifications have been made, the controlling party should ensure that capacity, operation, warning and maintenance instruction plates, tags or decals are changed accordingly.

Operating Safety Rules and Practices

Only authorized persons should be allowed to operate the vehicle. It is recommended that no persons be allowed to operate the vehicle except those persons who possess a valid motor vehicle driver's license.

The controlling party should display the operation and safety instructions as recommended by the vehicle manufacturers and the safety rules in a conspicuous place near the vehicle rental area or vehicle pick-up area. It is also recommended, as with all motor vehicles, that the warning "Do not operate vehicle when under the influence of alcohol or drugs." Be posted in a conspicuous location.

Vehicle Specifications

8-Passenger Bus

BN48-08-AC-ADS

Passengers	8
Battery	72V, 12 x 6 V, Trojan T105
Motor	7.5 KW (10 HP), AC
Controller	550A Curtis controller, 72V
Charger	Full automatic charger, 72V, 12A, UL listed
Top speed (mph)	18
Load capacity (lbs)	1400
Dimensions (in)	146 x 57 x 77
Weight (lbs)	1500
Ground clearance (in)	6
Turning radius (ft)	18
Wheel base (in)	83
Climbing ability (loaded)	20%
Front suspension	Independent, coil over shock
Rear suspension	Leaf spring and shock
Steering system	Rack and pinion power steering
Brake System	4-wheel hydraulic drum
Tire size	165/70 R 13 DOT
Tire pressure (psi)	44
Wheel type	13 inch polished aluminum
Differential	Whole style steel rear axle, reduction ratio: 14.67:1
Charger	20 A / 72 V, full automatic high frequency charger
Brake range (ft)	16
Chassis	Steel

11-Passenger Bus

BN72-11-ADS-AC

Passengers	11
Battery	72V, 12 x 6 V, Trojan T105
Motor	7.5 KW (10 HP), AC
Controller	550A Curtis controller
Charger	Full automatic charger, 72V, 12A, UL listed
Top speed (mph)	18
Load capacity (lbs)	2645
Dimensions (in)	180 x 61 x 79
Weight (lbs)	1650
Ground clearance (in)	5.5
Turning radius (ft)	22
Wheel base (in)	106
Climbing ability (loaded)	20%
Front suspension	Independent, coil over shock
Rear suspension	Leaf spring and shock
Steering system	Rack and pinion power steering
Brake System	4-wheel hydraulic drum
Tire size	165/70 R 13 DOT
Tire pressure (psi)	44
Wheel type	13 inch polished aluminum
Differential	Whole style steel rear axle, reduction ratio: 18.125:1
Charger	20 A / 72 V, full automatic high frequency charger
Brake range (ft)	17
Chassis	Steel

14-Passenger Bus

BN72-14-ADS-AC

Passengers	14
Battery	72V, 12 x 6 V, Trojan T105
Motor	7.5 KW (10 HP), AC
Controller	550A Curtis controller
Charger	Full automatic charger, 72V, 12A, UL listed
Top speed (mph)	18
Load capacity (lbs)	2640
Dimensions (in)	186 x 60 x 81
Weight (lbs)	1900
Ground clearance (in)	5.5
Turning radius (ft)	19
Wheel base (in)	105
Climbing ability (loaded)	20%
Front suspension	Independent, coil over shock
Rear suspension	Leaf spring and shock
Steering system	Rack and pinion power steering
Brake System	4-wheel hydraulic drum
Tire size	165/70 R 13 DOT
Tire pressure (psi)	44
Wheel type	13 inch polished aluminum
Differential	Whole style steel rear axle, reduction ratio: 18.125:1
Charger	20 A / 72 V, full automatic high frequency charger
Brake range (ft)	18
Chassis	Steel

23-Passenger Bus

BN72-23

Passengers	23
Battery	72V, 12 x 6 V, Trojan batteries (two sets optional)
Motor	12 HP, AC
Controller	Curtis AC 550A, 72V
Charger	Full automatic charger, 72V, 12A, UL listed
Top speed (mph)	18
Load capacity (lbs)	3850
Dimensions (in)	221 x 83 x 89
Weight (lbs)	3080
Ground clearance (in)	5.5
Turning radius (ft)	26
Wheel base (in)	135
Climbing ability (loaded)	15%
Front suspension	Independent, coil over shock
Rear suspension	Leaf spring and shock
Steering system	Rack and pinion power steering
Brake System	4-wheel hydraulic drum
Tire size	195/70 R 15C
Tire pressure (psi)	44
Wheel type	Steel 6JJ-15
Differential	Whole style steel rear axle, reduction ratio: 12.49:1
Charger	20 A / 72 V, full automatic high frequency charger
Brake range (ft)	15
Chassis	Steel

Read all of manual to become thoroughly familiar with this vehicle. Pay particular attention to all Notes, Cautions and Warnings.

Thank you for purchasing this vehicle. Before driving the vehicle, we ask you to spend some time reading this Owner's Manual and Service Guide. This guide contains the information that will assist you in maintaining this highly reliable vehicle.

This vehicle has been designed and manufactured as a "World Vehicle". Some countries have individual requirements to comply with their specifications: therefore, some sections may not apply in your country.

Most of the service procedures in this guide can be accomplished using common automotive hand tools.

Before Initial Use

Read, understand and follow the safety label on the instrument panel. Be sure you understand how to operate the vehicle, its equipment and how to use it safely. Maintaining good performance depends to a large extent on the operator.

Vehicle batteries must be fully charged before initial use. Check for correct tire inflation. See *Vehicle Specifications*.

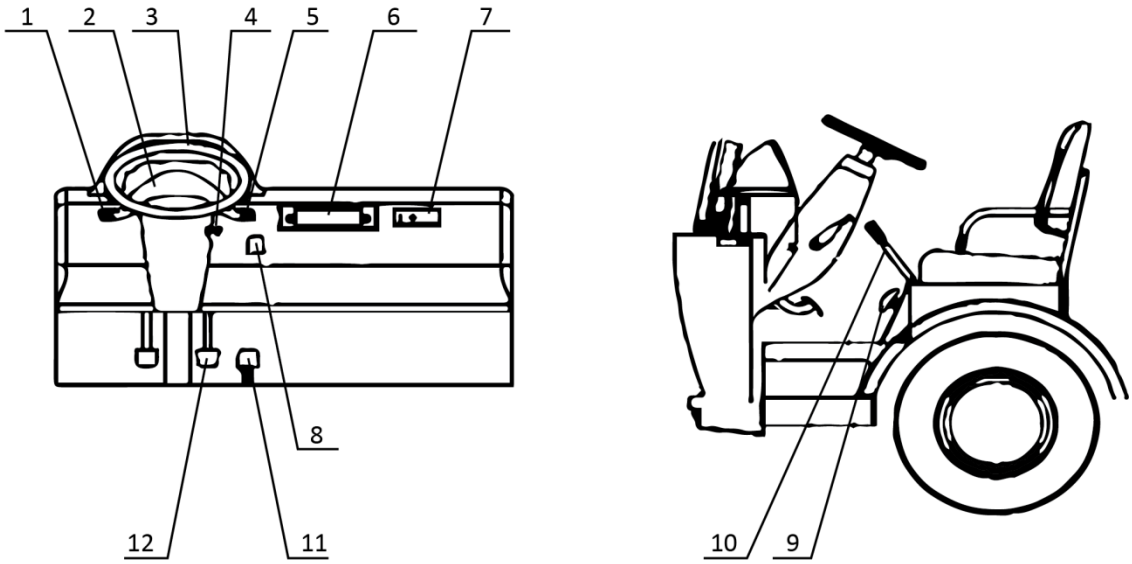
Determine and record braking distance required to stop vehicle for future brake performance tests.

Remove the protective clear plastic that protect the seat bottom and back rest during shipping, before placing the vehicle in service.

WARNING: To prevent overheating that may cause serious damage to the charger and create the potential for fire, do not block or obstruct the airways. Portable chargers must be mounted on a platform above the ground or in such a manner as to permit the maximum airflow underneath and around the charger.

Portable chargers are shipped with the vehicle. Prior to vehicle or charger operation, chargers must be removed and mounted on a platform or wall above the ground to permit maximum airflow around and underneath the charger. If the charger is operated in an outdoor location, rain and sun protection must be provided.

Controls and Indicators



1| Front light and turning light switch
2| Horn
3| Steering wheel
4| Key switch
5| Windshield wiper switch
6| CD player (optional part)
7| Light switch
8| Forward/reverse switch
9| Charging receptacle
10| Parking brake handle
11| Accelerator pedal
12| Brake pedal

WARNING: To prevent loss of control, do not move direction selector while the vehicle is in motion. Moving the selector will result in a sudden slowing of the vehicle and the beeping of a warning device.

Unintentional movement of the accelerator pedal will release the park brake and may cause the vehicle to move which could result in severe injury or death. To reduce the possibility of severe injury or death resulting from loss of vehicle control, the following warnings must be observed:

When driving vehicle, consider the terrain, traffic conditions and the environmental factors which affect the terrain and the ability to control the vehicle.

Use extra care and reduced speed when driving on poor surfaces, such as loose dirt, wet grass, gravel, etc.

Stay in designated areas and avoid extremely rough terrain.

Maintain a safe speed when driving downhill. Use service brake to control speed when traveling down an incline. A sudden stop or change of direction may result in loss of control.

Slow down before and during turns. All turns should be made at reduced speed.

WARNING: To reduce the possibility of severe injury or death resulting from improper vehicle operation, the following warnings must be observed:

Refer to *Vehicle Specifications* for seating capacity.

Depressing accelerator pedal will release foot operated park brake and may cause inadvertent vehicle movement. Turn the key to the 'OFF' position whenever the vehicle is parked.

To prevent inadvertent movement when the vehicle is to be left unattended, engage the park brake, move direction selector to forward position, turn key to 'OFF' position and remove key.

Make sure that the direction selector is in correct position before attempting to start the vehicle.

Always bring the vehicle to a complete stop before shifting the direction selector.

Do not take vehicle out of 'gear' while in motion (coast).

Check the area behind the vehicle before operating in reverse.

All occupants must be seated. Keep entire body inside vehicle and hold on while vehicle is in motion.

Vehicle Cleaning and Care

WARNING: To reduce the possibility of severe injury or vehicle damage, read and understand all instructions supplied by manufacturer of pressure washer.

CAUTION: When pressure washing exterior of vehicle, do not use pressure in excess of 700 psi. To reduce the possibility of cosmetic damage, do not use any abrasive or reactive solvents.

It is important that proper techniques and cleaning materials be used. Using excessive water pressure may cause severe injury to operator or bystander, damage to seals, plastics, seat material, body finish or electrical system. Do not use pressure in excess of 700 psi to wash exterior of vehicle.

Clean windshield with lots of water and a clean cloth. Minor scratches may be removed using a commercial plastic polish.

Normal cleaning of vinyl seats and plastic or rubber trim requires the use of a mild soap solution applied with a sponge or soft brush and wipe with a damp cloth.

The painted surfaces of the vehicle provide attractive appearance and durable protection. Frequent washing with lukewarm or cold water and mild detergent is required to preserve the painted surface.

Occasional cleaning and waxing with non-abrasive products designed for 'clear coat' automotive finishes will enhance the appearance and durability of the painted surfaces.

Corrosive materials used as fertilizers can collect on the underbody of the vehicle. These materials will cause corrosion of underbody parts unless flushed occasionally with plain water. Thoroughly clean any areas where mud or other debris can collect. Sediment packed in closed areas should be loosened to ease removal, taking care not to chip or otherwise damage paint.

Periodic Service Schedule

NOTE: Some maintenance items must be serviced more frequently on vehicles used under severe driving conditions.

Daily

Before Use:

- Check general operation of service brake
- Check park brake function
- Check warning device function in reverse
- Check tire condition
- Check overall vehicle condition

After Use:

- Recharge batteries to full state of charge after each day's use
- Inspect charger connector and receptacle at each charge

Weekly

Tires: Examine for cuts, excessive wear and pressure (See *Vehicle Specifications*)

Wheels: Check for bent rims, missing or loose lug nuts

Monthly (20 hours)

Batteries:

- Clean batteries and terminals. See Battery Cleaning
- Check charge condition and all connections

Wiring: Check all wiring for loose connections and broken insulation

Charger / Receptacle: Clean connections, keep receptacles free of dirt and foreign matter

Accelerator: Check for smooth movement

Service Brake (Mechanical Brakes): Conduct brake performance test

Park Brake: Check brake performance and adjust if required

Direction Selector: Check attachment, tighten if required

Steering Assembly: Check for abnormal play, tightness of all hardware

Tie Rod / Linkages: Check for excessive play, bent components, or loose connections

Rear Axle: Check for leakage, add lubricant level as required

Quarterly (50 hours)

Front Axle: Check for damage to axle and loose or missing hardware

Front Shock Absorbers: Check for oil leakage and loose fasteners

Front Springs: Check for loose hardware, cracks at attachments

Front Wheel Alignment: Check for unusual tire wear, align if required

Park Brake:

- Check for bent/binding linkage rod
- Check for damage or wear to latch arm or catch bracket
- Lubricate as required, use light oil. **Do not lubricate cables or brake latch.**

Rear Shock Absorbers: Check for oil leakage, loose mounting hardware

Charger Plug: Clean auxiliary contact (see *Battery Charger Maintenance*)

Hardware and Fasteners:

- Check for loose or missing hardware and components
- Tighten or replace missing hardware

Semi-Annual (125 hours)

Direction Selector: Check for wear and smooth movement (lubricate shaft with light oil if required)

King Pins: Check for excessive play and tightness of retaining nuts

Steering Assembly: Check bellows and pinion seal for damage or grease leakage

Rack End Ball Joint: Lubricate, use wheel bearing grease

Rear Axle: Check for unusual noise and loose or missing mounting hardware

Annual (250-300 hours)

Front Wheel Bearings: Check and adjust as required, see *Technician's Repair and Service Manual*

Rear Axle: Check lubricant, add lubricant level as required

Service Brakes:

- Clean and adjust
- Check brake shoe linings

Tire Inspection

Tire condition should be inspected per the Periodic Service Schedule. Inflation pressures should be checked when the tires are cool. Be sure to install the valve dust cap after checking or inflating.

Periodic Brake Test for Mechanical Brake

WARNING: To reduce the possibility of severe injury or death, always evaluate pedal travel before operating a vehicle to verify some braking function is present.

All driving brake tests must be done in a safe location with regard for the safety of all personnel.

NOTE: Over time, a subtle loss of performance may take place. Therefore, it is important to establish the standard with a new vehicle.

The Periodic Brake Performance Test should be performed regularly (Ref. Fig. 16) as an evaluation of braking system performance. It is useful as a method of identifying subtle loss of performance over time.

The purpose of this test is to compare the braking performance of vehicle to the braking performance of new or "known to be good" vehicle or to an established acceptable stopping distance. Actual stopping distances will be influenced by weather conditions, terrain, road surface condition, actual vehicle weight (accessories installed) and vehicle speed. The test is conducted by latching the parking brake to eliminate different pedal pressures and to include the effects of errors in linkage adjustment.

Establish the acceptable stopping distance by testing a new or "know to be good" vehicle and recording the stopping location or stopping distance. For fleets of vehicles, several vehicles should be tested when new and the range of stopping locations or distances recorded.

Drive the vehicle at maximum speed on a flat, dry, clean paved surface (Ref. Fig 10). Quickly depress the brake pedal to latch the parking brake at the line or marker in the test area and remove foot from pedal. The vehicle should stop aggressively. The wheel brakes may or may not lock. Observe the vehicle stopping location or measure the vehicle stopping distance from the point at which the brakes were latched. The vehicle should stop within the 'normal' range of stopping distances. If the vehicle stops more than 4 ft. (3.0m) beyond the acceptable stopping distance or pulls to one side, the vehicle has failed the test and should be tested again.

If the vehicle fails the second test, it should immediately be removed from service. The vehicle must be inspected by a qualified mechanic who should refer to the *Troubleshooting* section in the *Technician's Repair and Service Manual*.

Lubrication

Checking the Lubricant Level

Clean the area around the check/fill plug and remove plug. The correct lubricant level is just below the bottom of the threaded hole. If lubricant is low, add lubricant as required. Add lubricant slowly until lubricant starts to seep from the hole. Install the check/fill plug. In the event that the lubricant is to be replaced, the vehicle must be elevated and the oil pan removed or the oil siphoned through the check/fill hole.

CAUTION: Do not use more than ½ - ¾ of grease in any grease fitting at any one time. Excess grease may cause grease seals to fail or grease migration into areas that could damage components.

Batteries and Charging

Safety

NOTE: Always observe the following warnings when working on or near batteries.

WARNING: To prevent battery explosion that could result in severe personal injury or death, keep all smoking materials, open flame or sparks away from the batteries.

Hydrogen gas is formed when charging batteries. Do not charge batteries without adequate ventilation. A 4% concentration of hydrogen gas is explosive.

Be sure that the key switch is off and all electrical accessories are turned off before starting work on vehicle.

Never disconnect a circuit under load at a battery terminal.

Batteries are heavy. Use proper lifting techniques when moving them. Always lift the battery with a commercially available battery lifting device. Use care not to tip batteries when removing or installing them; spilled electrolyte can cause burns and damage.

The electrolyte in a storage battery is an acid solution which can cause severe burns to the skin and eyes. Treat all electrolyte spills to the body and eyes with extended flushing with clear water. Contact a physician immediately.

Always wear a safety shield or approved safety goggles when adding water or charging batteries.

Any electrolyte spills should be neutralized with a solution of 1/4 cup (60 mL) sodium bicarbonate (baking soda) dissolved in 1½ gallons (6 liters) of water and flushed with water.

Overfilling batteries may result in electrolyte being expelled from the battery during the charge cycle. Expelled electrolyte may cause damage to the vehicle and storage facility.

Aerosol containers of battery terminal protectant must be used with extreme care. Insulate metal container to prevent can from contacting battery terminals which could result in an explosion.

Wrap wrenches with vinyl tape to prevent the possibility of a dropped wrench from 'shorting out' a battery, which could result in an explosion and severe injury or death.

Battery

A battery is defined as two dissimilar metals immersed in an acid. If the acid is absent or if the metals are not dissimilar, a battery has not been created. The batteries most commonly used in these vehicles are lead acid.

A battery does not store electricity, but is able to produce electricity as the result of a chemical reaction which releases stored chemical energy in the form of electrical energy. The chemical reaction takes place faster in warm conditions and slower in cold conditions. Temperature is important when conducting tests on a battery and test results must be corrected to compensate for temperature differences.

As a battery ages, it still performs adequately except that its capacity is diminished. Capacity describes the time that a battery can continue to provide its design amperes from a full charge.

A battery has a maximum life, therefore good maintenance is designed to maximize the available life and reduce the factors that can reduce the life of the battery.

Battery Charging

The battery charger is designed to fully charge the battery set. If the batteries are severely deep cycled, some automatic battery chargers contain an electronic module that may not activate and the battery charger will not function. Automatic chargers will determine the correct duration of charge to the battery set and will shut off when the battery set is fully charged. Always refer to the instructions of the specific charger used.

Charging batteries properly requires administering the right amount of current at the right voltage. Most charging equipment automatically regulates these values. Some chargers allow the user to set these values. For proper charging, refer to the instructions that came with your charging equipment.

Before charging, the following should be observed.

- Be familiar with and follow the instructions issued by the charger manufacturer.
- Batteries should be charged after each period of use.
- Lead acid batteries need not be fully discharged before recharging.
- Charge only in well-ventilated area. Keep sparks or flames away from a charging battery.
- Verify charger voltage settings are correct.
- Check electrolyte level. (See *Electrolyte Level and Water* section.)
- Tighten all vent caps before charging.
- Do not overcharge or undercharge the batteries.

- Do not charge a frozen battery.
- Avoid charging at temperatures above 48°C.

Battery Maintenance

WARNING: To reduce the possibility of fire, never attach a battery charger to a vehicle that is to be unattended beyond the normal charging cycle. Overcharging could cause damage to the vehicle batteries and result in extreme overheating. The charger should be checked after 24 hours and unplugged after the charge cycle is complete.

Before charging the batteries, inspect the plug of the battery charger and vehicle receptacle housing for dirt or debris. Charge the batteries after each day's use.

Monthly:

- Inspect all wiring for fraying, loose terminations, corrosion or deterioration of insulation.
- Check that the electrolyte level is correct and add suitable water as required.
- Clean the batteries and wire terminations.

Our experience shows that the key to achieving optimum performance and long life is a solid battery maintenance program using the simple procedures outline here.

Equipment: We recommend the following equipment for use in battery care and maintenance:

- Wrench
- Distilled Water
- Voltmeter
- Hydrometer
- Thermometer
- Post Cleaner
- Baking Soda
- Vaseline
- Goggles & Gloves

CAUTION: Always wear protective clothing, gloves, and goggles when handling batteries, electrolyte, and charging your battery.

Batteries should be carefully inspected on a regular basis in order to detect and correct potential problems before they can do harm. It is a great idea to start this routine when the batteries are first received.

Inspection Guideline

1| Examine the outside appearance of the battery.
- Look for cracks in the container.
- The top of the battery, posts, and connections should be clean, free of dirt, fluids, and corrosion.
- Repair or replace any damaged batteries.

2| Any fluids on or around the battery may be an indication that electrolyte spilling, leaching, or leaking out.
- Leaking batteries must be repaired or replaced.

3| Check all battery cables and their connections.
- Look closely for loose or damaged parts.
- Battery cables should be intact; broken or frayed cables can be extremely hazardous.
- Replace any cable that looks suspicious.

4| Tighten all wiring connections to the proper specification. Make certain there is good contact with the terminals.

WARNING:

- **Do not smoke near batteries.**
- **Do not over-tighten terminals. Doing so can cause post breakage, post meltdown, or fire.**

Battery Cleaning

CAUTION: To prevent battery damage, be sure that all battery caps (if equipped) are tightly installed.

To reduce the possibility of damage to vehicle or floor, neutralize acid before rinsing battery.

To reduce the possibility of damage to electrical components while cleaning, do not use a pressure washer.

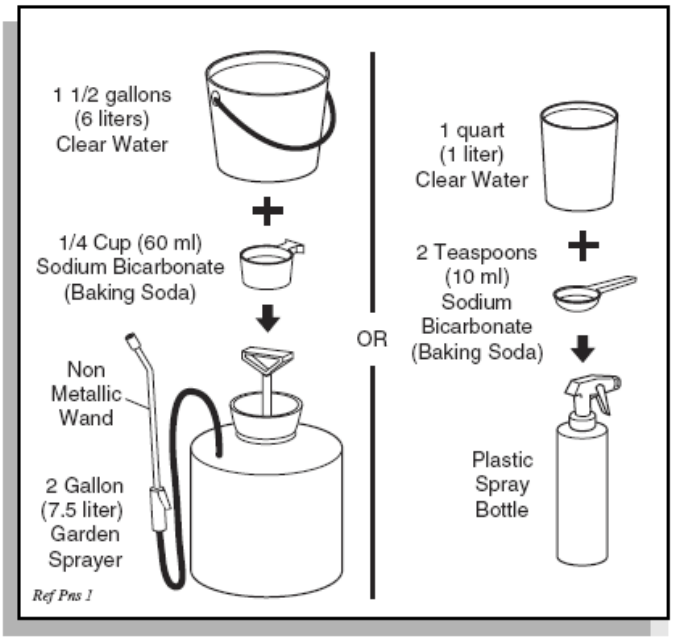
Cleaning should take place per the Periodic Service Schedule (Ref. Fig. 16).

When cleaning the outside of batteries and terminals, first spray with a solution of sodium bicarbonate (baking soda) and water to neutralize any acid deposits before rinsing with clear water.

Use of a water hose without first neutralizing any acid will move acid from the top of batteries to another area of the vehicle or storage facility where it will attack the metal structure or the concrete/asphalt floor. Additionally, conductive residue will remain on the batteries and contribute to their discharge.

WARNING: To reduce the possibility of battery explosion that could result in severe injury or death, do not use metallic spray wand to clean battery and keep all smoking materials, open flame, and sparks away from the battery.

The correct cleaning technique is to spray the top and sides of the batteries with a solution of sodium bicarbonate (baking soda) and water. This solution is best applied with a garden type sprayer equipped with a **non-metallic spray wand or plastic spray bottle**. The solution should consist of the ingredients shown in the illustration (Ref. Fig.18). In addition, special attention should be paid to metal components adjacent to the batteries which should also be sprayed with the solution.



Preparing Acid Neutralizing Solution

Allow the solution to sit for at least three minutes. Use a soft bristle brush or cloth to wipe the tops of the batteries to remove any conductive residue. Rinse the entire area with low pressure clear water. Do not use a pressure washer. All of the items required for complete battery cleaning and watering (electric vehicles only) are contained in the Battery Maintenance Kit.

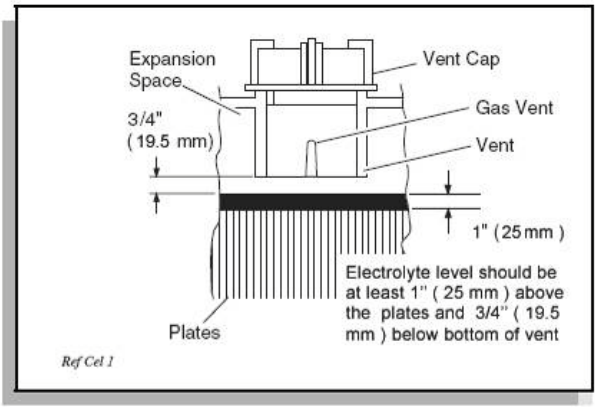
Batteries seem to attract dust, dirt, and grime. Keeping them clean will help one spot trouble signs if they appear and avoid problems associated with grime. Check that all vent caps are tightly in place. Clean the battery top with a cloth or brush and a solution of baking soda and water.

When cleaning, do not allow any cleaning solution, or other foreign matter to get inside the battery. Clean battery terminals and the inside of cable clamps using a post and clamp cleaner. Clean terminals will have a bright metallic shine.

Reconnect the clamps to the terminals and thinly coat them with petroleum jelly (Vaseline) to prevent corrosion. Keep the area around batteries clean and dry.

Electrolyte Level and Water

Correct level of the electrolyte is 1" (25 mm) above the plates in each cell.


Expansion Space
3/4" (19.5 mm)
Vent Cap
Gas Vent
Vent
1" (25 mm)
Electrolyte level should be at least 1" (25 mm) above the plates and 3/4" (19.5 mm) below bottom of vent
Plates
Ref Cel 1

This level will leave approximately ¾" (19.5 mm) of space between the electrolyte and the vent tube. The electrolyte level is important since any portion of the plates exposed to air will be ruined beyond repair. Likewise, too much water will result in electrolyte being forced out of the battery due to gassing and the increase in volume of the electrolyte that results from the charging cycle.

CAUTION: Do not overfill batteries. The charging cycle will expel electrolyte and result in component damage.

A battery being charged will "gas" with the majority of the gassing taking place at the end of the charging cycle. This gas is hydrogen which is lighter than air. Water and sulfuric acid droplets

will be carried out of the battery vents by the hydrogen gas; however, this loss is minimal. If the battery electrolyte level is too high, the electrolyte will block the vent tube and the gas will force it out of the vent tube and battery cap. The water will evaporate but the sulfuric acid will remain where it can damage vehicle components and the storage facility floor. Sulfuric acid loss will weaken the concentration of acid within the electrolyte and reduce the life of the battery.

Over the life of the battery, a considerable amount of water is consumed. It is important that the water used be pure and free of contaminants that could reduce the life of the battery by reducing the chemical reaction. The water must be distilled or purified by an efficient filtration system. Water that is not distilled should be analyzed and if required, filtration installed to permit the water to meet the requirements of the water purity table.

Impurity	*Parts per Million*
Color	Clear
Suspended	Trace
Total Solids	100
Calcium and Magnesium Oxides	40
Iron	5
Ammonia	8
Organic and Volatile Matter	50
Nitrites	5
Nitrates	10
Chloride	5

NOTE: Even if the water is colorless, odorless, tasteless and fit for drinking, the water should be analyzed to see that it does not exceed the impurity levels specified in the table.

Watering (Flooded batteries only)

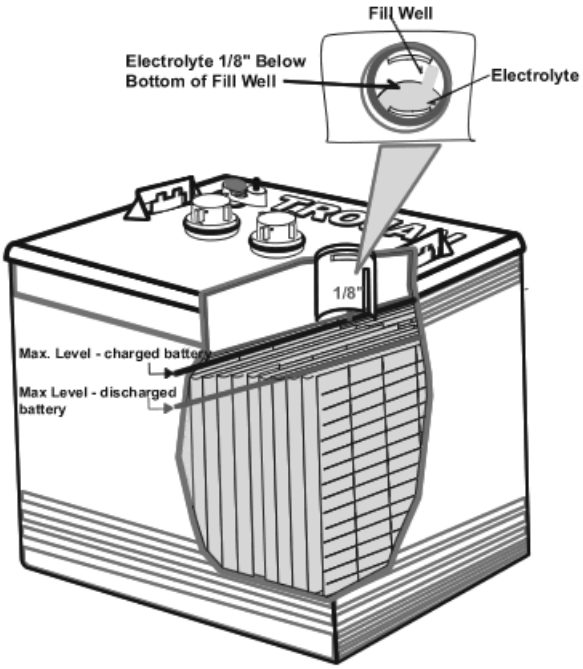
Flooded batteries need water. More importantly, watering must be done at the right time and in the right amount or else the battery's performance and longevity suffers.

Water should always be added after fully charging the battery. Prior to charging, there should be enough water to cover the plates. If the battery is discharged (partially or fully), the water level should also be higher than the plates.

Keeping the water at the correct level after a full charge will prevent having to worry about the water level at a different state of charge.

- Do not let the plates get exposed to air.
- Do not fill the water all the way up to the cap.
- Do not use water with a high mineral content.
- Use distilled or de-ionized water only.

CAUTION: The electrolyte is a solution of acid and water so skin contact should be avoided.



Procedure:

1| Open the vent caps and look inside the fill wells. Check electrolyte level; the minimum level is at the top of the plates.

2| If there is no electrolyte visible, add just enough distilled/de-ionized water to cover the plates.

3| Replace and tighten all water vent caps.

4| Put batteries on a complete charge before adding any additional water (refer to the *Charging* section).

5| Once charging is completed, remove the vent caps and check the electrolyte level.

6| Add water until the electrolyte level is 1/8" below the bottom of the fill well.

7| Clean, replace, and tighten all vent caps.

WARNING: Never add acid to a battery.

Battery Replacement

Remove battery and hold down and cables. Lift out batteries with a commercially available lifting device.

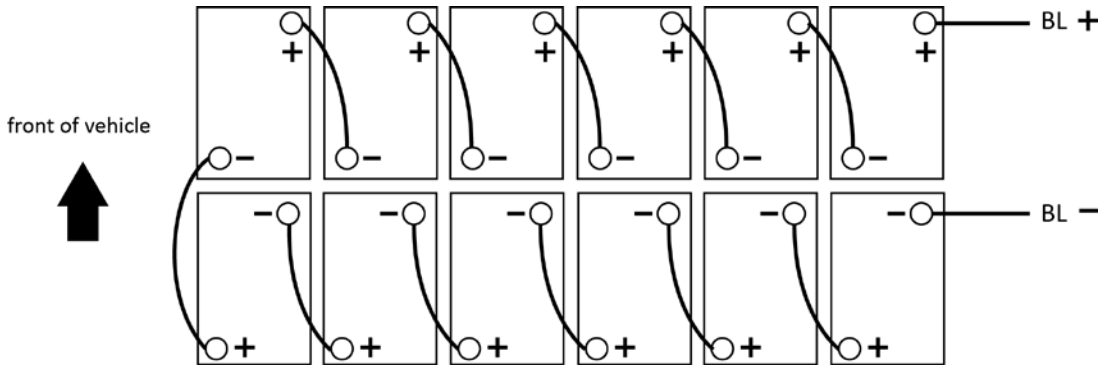
If the batteries have been cleaned and any acid in the battery rack area neutralized as recommended, no corrosion to the battery racks or surrounding area should be present. Any corrosion found should be immediately removed with a putty knife and a wire brush. The area should be washed with a solution of sodium bicarbonate (baking soda) and water and thoroughly dried before priming and painting with a corrosion resistant paint.

The batteries should be placed into the battery racks and the battery hold downs tightened to 45 - 55 in. lbs. (5 - 6 Nm) torque, to prevent movement but not tight enough to cause distortion of the battery cases.

Inspect all wires and terminals. Clean any corrosion from the battery terminals or the wire terminals with a solution of sodium bicarbonate (baking soda) and brush clean if required.

WARNING: To prevent battery explosion that could result in severe personal injury or death, extreme care must be used with aerosol containers of battery terminal protectant. Insulate the metal container to prevent the metal can from contacting battery terminals which could result in an explosion.

Use care to connect the battery wires as shown. Tighten the battery post hardware to 50 - 70 in. lbs. (6 - 8 Nm) torque. Protect the battery terminals and battery wire terminals with a commercially available protective coating.



Battery Connections

A new battery must mature before it will develop its maximum capacity. Maturing may take up to 100 charge/discharge cycles. After the maturing phase, the older a battery gets, the lower the capacity. The only way to determine the capacity of a battery is to perform a load test using a discharge machine following manufacturer's recommendations.

Prolonged Storage

CAUTION: Battery charger, controller and other electronic devices need to be disconnected since they will contribute to the premature discharge of batteries.

During periods of storage, the batteries will need attention to keep them maintained and prevent discharge.

In high temperatures the chemical reaction is faster, while low temperatures cause the chemical reaction to slow down. A vehicle that is stored at 90° F (32° C) will lose .002 of specific gravity each day. If a fully charged battery has a specific gravity of 1.275, and the battery is allowed to sit unused, it will become partially discharged. When it reaches 1.240, which it will do in less than twenty days, it should be recharged. If a battery is left in a discharged state, sulfating takes place on and within the plates. This condition is not reversible and will cause permanent damage to the battery. In order to prevent damage, the battery should be recharged. A hydrometer can be used to determine the specific gravity and therefore the state of charge of a battery.

In winter conditions, the battery must be fully charged to prevent the possibility of freezing. A fully charged battery will not freeze in temperatures above -75° F (-60° C). Although the chemical reaction is slowed in cold temperatures, the battery must be stored fully charged, and disconnected from any circuit that could discharge the battery. For portable chargers, disconnect the charging plug from the vehicle receptacle. The batteries must be cleaned and all deposits neutralized and removed from the battery case to prevent self discharge. The batteries should be tested or recharged at thirty day minimum intervals.

Periods of inactivity can be extremely harmful to lead acid batteries. When placing a battery into storage, follow the recommendations below to insure that the battery remains healthy and ready for use.

The most important things to avoid:

Freezing: Avoid locations where freezing temperature is expected. Keeping a battery at a high state of charge will also prevent freezing. (See following table.)

Heat: Avoid direct exposure to heat sources, such as radiators or space heaters. Temperatures above 80°F accelerate the battery's self-discharge characteristics.

Storage Procedure

1| Completely charge the battery before storing.

2| Store the battery in a cool, dry location, protected from the elements.

3| During storage, monitor the specific gravity (flooded) or voltage. Batteries in storage should be given a boost charge when they show a 70% charge or less. See Table 1 in the Testing Section.

4| Completely charge the battery before re-activating.

5| For optimum performance, equalize the batteries (flooded) before putting them back into service. Refer to the Equalizing section for this procedure.

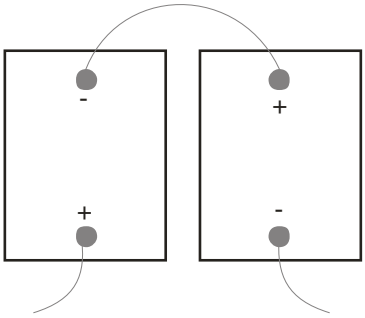
Electrolyte Freezing Point at Various States of Charge

Specific Gravity (g/cm^3)	*State of Charge*	*Freezing Temperature*
1.28	100%	-68.9
1.265	92%	-57.4
1.25	85%	-52.2
1.2	62%	-26.7
1.15	40%	-15
1.1	20%	-7.2

How to Increase System Power

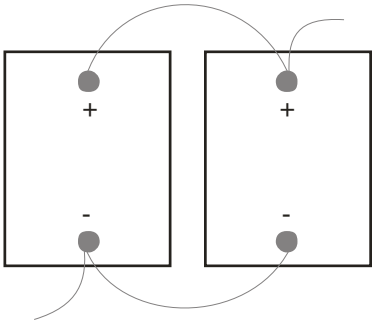
Two or more batteries can be easily connected to boost your system's voltage and/or capacity. There are three methods to obtain additional voltage and/or capacity, as described below:

To increase voltage, connect batteries in series.

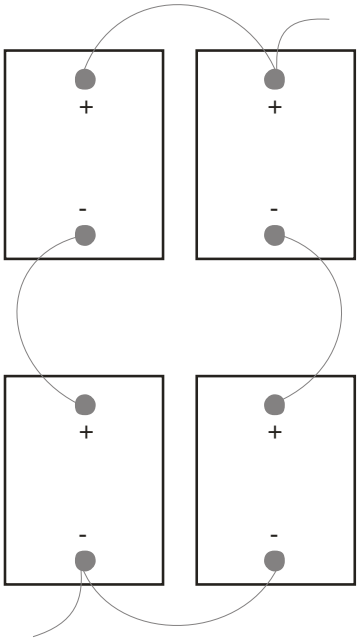


Battery System: 12 Volt, 225 AH using Two Trojan T105 Deep Cycle Batteries (6 Volts, 225 AH)

To increase amp-hour capacity, connect batteries in parallel.



Battery System: 6 Volt, 450 AH using Two Trojan T105 Deep Cycle Batteries (6 Volts, 225 AH)



Battery System: 12 Volt, 450 AH using Four Trojan T105 Deep Cycle Batteries (6 Volts, 225 AH)

NOTE: This system can also be configured using 12-volt batteries. It is not recommended that you mix batteries of different voltages within the same system.

Troubleshooting

In general, troubleshooting will be done for two distinct reasons. First, a battery that performs poorly and is outside of the manufacturer's specification should be identified in order to replace it under the terms of the manufacturer's warranty. Different manufacturers have different requirements. Consult the battery manufacturer or a manufacturer representative for specific requirements.

The second reason is to determine why a particular vehicle does not perform adequately. Performance problems may result in a vehicle that runs slowly or in a vehicle that is unable to operate for the time required.

Problem	Possible reason	Processing methods
Under steering	Tire air pressure is too low	According to the tire requirements, inflate the tire
	Turning part is not lubricated	Daub lubricant
Abnormal abrasion on tire	The toe-in is not correct	Adjust the toe-in
	Tire air pressure is not correct	According to the tire requirements, adjust the tire pressure
	Overexert when braking	Adjust the stroke of brake pedal
Running speed is slow	Battery voltage is low or battery is aging	Check the voltage of single battery. If it is less than 1V, the battery is aging; replace it. It is advised to check the electrolyte level which should be greater than 15-20 mm. If issue is not solved, replace the battery.
	The running speed is low when depressing the accelerate pedal	If the accelerator pedal is loose, fasten the screws on the pedal. Measure the output voltage while accelerating. The normal range is 0-5 V. If it is out of this range, replace the accelerator.

	Connection joint of master circuit is loose.	Check each connection joint. If there is an issue, please pull the inserted part out and adjust the inserted-spring of rubber rind, then insert the terminal again.
	Arrester fault resulting from cart running with load.	Adjust the arrester.
Poor braking condition	Brake compensator is loose	Adjust brake draw-bar
	Brake shoe is worn	Replace the brake shoe or brake cable
Cart cannot move	Without control power	Check the control fuse: if it is broken, replace. Check jiggle switch on the charge socket for looseness. Fasten it to the connection cables. Turn on the key-lock switch and if the input and output cables cannot be connected, replace a with new key-lock switch. If the battery does not have a normal working voltage, charge it as soon as possible.
	Operation panel is disabled	Check the connection cables on the operation panel for looseness; if loose, fasten it. When using the direction selector, the control contact joint should be connected. If disconnected, replace.
	Low voltage and controller protection	Charge battery as soon as possible
	Running with too heavy a load for a long period that results in the controller over-heat protection.	After the temperature of the controller comes down, the protection status should recover.

Specific Gravity Testing

A cost effective way to identify a poorly performing battery is to use a hydrometer to identify a battery in a set with a lower than normal specific gravity. Once the particular cell or cells that are the problem are identified, the suspect battery can be removed and replaced. At this point there is nothing that can be done to salvage the battery; however, the individual battery should be replaced with a good battery of the same brand, type and approximate age.

1| Do not add water at this time.

2| Wash hydrometer with de-ionized water.

3| Fill and drain the hydrometer 2 to 4 times before pulling out a sample.

4| There should be enough sampled electrolyte in the hydrometer to completely support the float.

5| Take a reading, record it, and return the electrolyte back to the cell.

6| Check electrolyte specific gravity for each cell, testing one cell temperature by thermometer.

7| Check all cells in the battery, repeating the steps above.

8| Replace the vent caps and wipe off any electrolyte that might have been spilled.

9| ρ 25℃ = ρ t +0.0007 (t-25)

ρ 25℃ ——25℃ electrolyte specific gravity

ρ t ——t℃ electrolyte specific gravity.

10| Check the state of charge using Table on the next page.

The readings should be at or above the specification of 1.280±0.01 g/cm^3. If any specific gravity readings register low, then follow the steps below:

1| Check and record voltage level(s).

2| Put battery on a complete charge.

3| Take specific gravity readings again.

If any specific gravity readings still register low then follow the steps below:

1| Check voltage level(s).

2| Perform charging. Refer to the charging section for the proper procedure.

3| Take specific gravity readings again.

If any specific gravity reading still registers lower than the specification of 1.280±0.01 g/cm^3 then one or more of the following conditions may exist:

- The battery is old and approaching the end of its life.
- The battery was left in a state of discharge too long.
- Electrolyte was lost due to spillage or overflow.
- A weak or bad cell is developing.
- Battery was watered excessively previous to testing.

Batteries in these conditions should be taken to a specialist for further evaluation or retired from service.

NOTE: Electrolyte specific gravity is 1.10 g/cm^3 under full charge.

Open-Circuit Voltage Test

For accurate voltage readings, batteries must remain idle (no charging, no discharging) for at least 6 hours, preferably 24 hours.

1| Disconnect all loads from the batteries.

2| Measure the voltage using a DC voltmeter.

3| Check the state of charge with the following table.

4| Charge the battery if it registers 0% to 70% charged.

If battery registers below the Table 1 values, the following conditions may exist:

- The battery was left in a state of discharge too long.
- The battery has a bad cell.

Batteries in these conditions should be taken to a specialist for further evaluation or retired from service.

State of charge as related to specific gravity and open circuit voltage

Percentage of Charge	*Specific Gravity (g/cm^3) Corrected to 25° C*	*Open circuit voltage*		
		6 V	*8 V*	*12 V*
100%	1.28	6.37	8.49	12.73
90%	1.26	6.31	8.41	12.73
80%	1.24	6.25	8.33	12.50
70%	1.22	6.19	8.25	12.37

60%	1.2	6.12	8.16	12.24
50%	1.18	6.05	8.07	12.1
40%	1.15	5.98	7.97	11.96
30%	1.13	5.91	7.88	11.81
20%	1.1	5.83	7.77	11.66
10%	1.07	5.75	7.67	11.51

Battery Terms Explained

Active Material In the positive plates, the active material is lead dioxide. In the negative, it's metallic sponge lead. When a circuit is created, these materials react with sulfuric acid during charging and discharging.

Ampere (Amp) A unit of measurement for the electron flow or current through a circuit.

Ampere-Hour (Amp. Hr., AH) A unit of measure for a battery's electrical storage capacity, calculated by multiplying the current in amperes by the time in hours. (Example: A battery which delivers 5 amps for 20 hours provides 5 amps ×20 hours = 100 AH of capacity.)

Capacity Rating The time in minutes that a new, fully-charged battery will deliver 25 amperes or 75 amperes at 800F and maintain a terminal voltage equal to or greater than 1.75 volts per cell.

Cell The basic current-producing unit in a battery. It consists of a set of positive plates, negative plates, electrolyte, separators and casing, A cell's nominal voltage is 2 volts. (Example: A 12-volt battery has 6 cells.)

Circuit The path followed by a flow of electrons. A closed, or short, circuit is a complete path. An open circuit has a broken path.

Cycle One discharge of a battery plus one recharge.

Depth of Discharge (DOD) The percentage of capacity actually removed from a battery compared to the total rated capacity.

Electrolyte In a deep cycle battery, it is a dilute solution of sulfuric acid and water.

Hydrometer A tool used to measure the specific gravity of the electrolyte solution.

Equalization An overcharge performed on flooded lead-acid batteries after they have been fully charged. This maintenance step helps eliminate stratification and sulfation.

Ohm A unit of measurement for electrical resistance within a circuit.

Open Circuit Voltage The voltage of a battery when there is no load attached(not receiving or delivering energy).This measurement is best taken when the battery has been at rest for at least 6 hours.

Power Inverter An electronic device that converts direct current (DC) power from a battery into standard alternating current (AC) house power.

Primary Battery An energy storage device that can deliver energy but cannot be recharged (i.e., disposable flashlight battery)

Secondary Battery An energy storage device than can deliver energy and can be recharged (i.e., automotive or deep cycle battery)

Separator A divider made of porous material that is placed between the positive and negative plates in a battery cell and allows current to flow through it, while preventing direct contact between the plates which would cause a short circuit.

Specific Gravity (S.G.) A measurement of the strength of battery electrolyte by comparing its density to that of pure water.

Stratification A condition where the concentration of acid is greater at the bottom of the battery that at the top.

Sulfation The formation of lead sulfate on the positive and negative electrodes.

Volt (V) A unit of measurement for electrical potential within a circuit.

Watt (W) A unit of measurement for electrical power.

Watt Hour (Wh) A unit of measurement for electrical power for a certain period of time.

Assembly

Front Windshield Assembly

Please take out all the spare parts in the container and assemble them according to the following steps.

1| Put the windshield up on the front body with the holes aligned.

2| After adjusting the windshield and front body so that they are aligned, insert screws.

When you affix the screws, take care to support the windshield frame at the back to avoid the windshield from falling and to keep the points aligned.

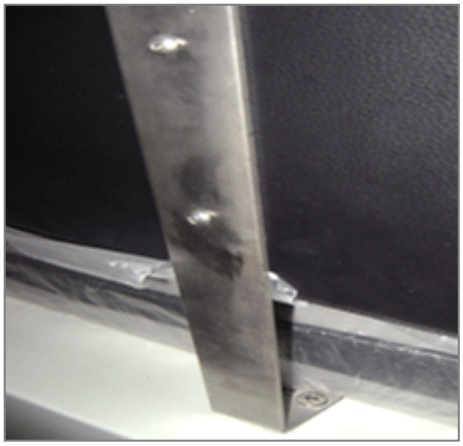
Frame B assembly

Frame B is the frame stand beside the driver and co-pilot seat. When you affix the windshield, stand the frame B to support it as well. Frame B is two pieces; one is the driver's side, the other is the co-pilot's side.

Frame B bottom bolt assembly

Frame B top bolt assembly

First row armrest assembly

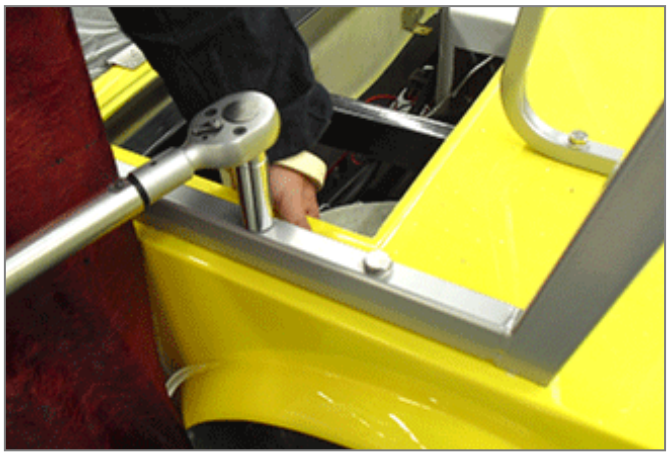


Affix the backrest first, then screw into the seat frame.

Frame C assembly

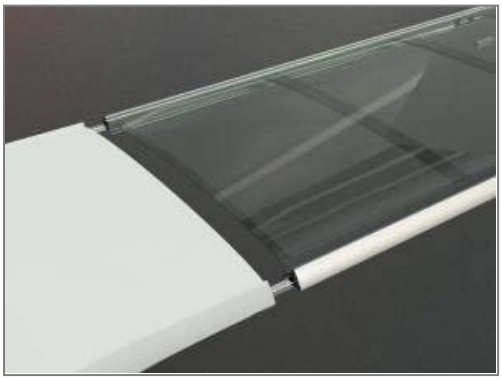
C frame left side

C frame right side



Take care to distinguish the right and left side.

The Canopy

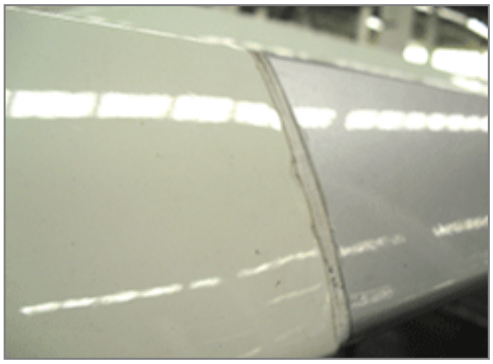


Insert the canopy tube into the front windshield frame, and connect them.

Make sure the windshield fits with the canopy frame tightly and affix the screws. After connecting, apply the sealant to prevent water damage.

Canopy Tail Assembly

Insert the canopy tube into the windshield frame.



Connect them tightly, and apply sealant.

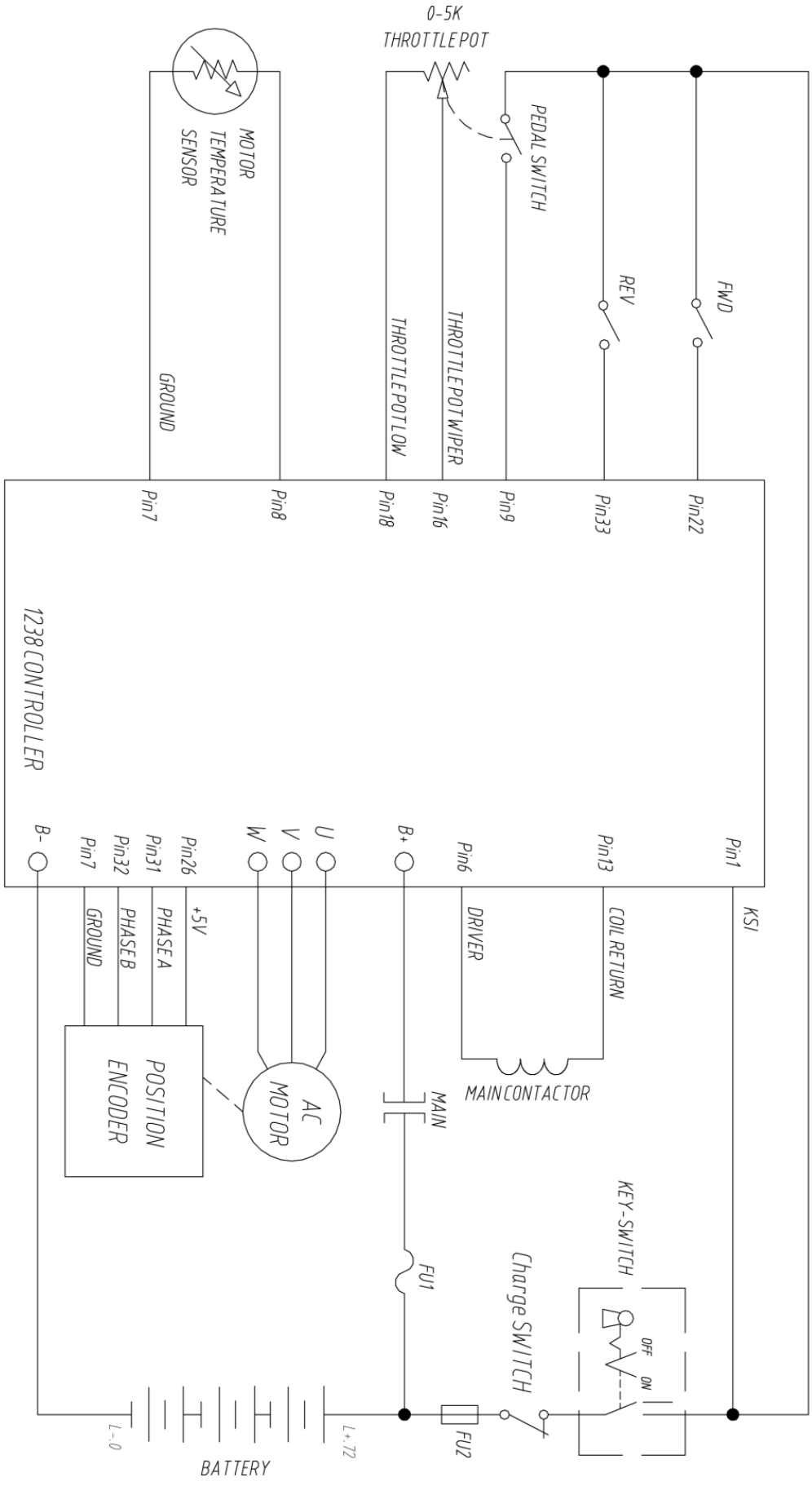
Backrest Assembly

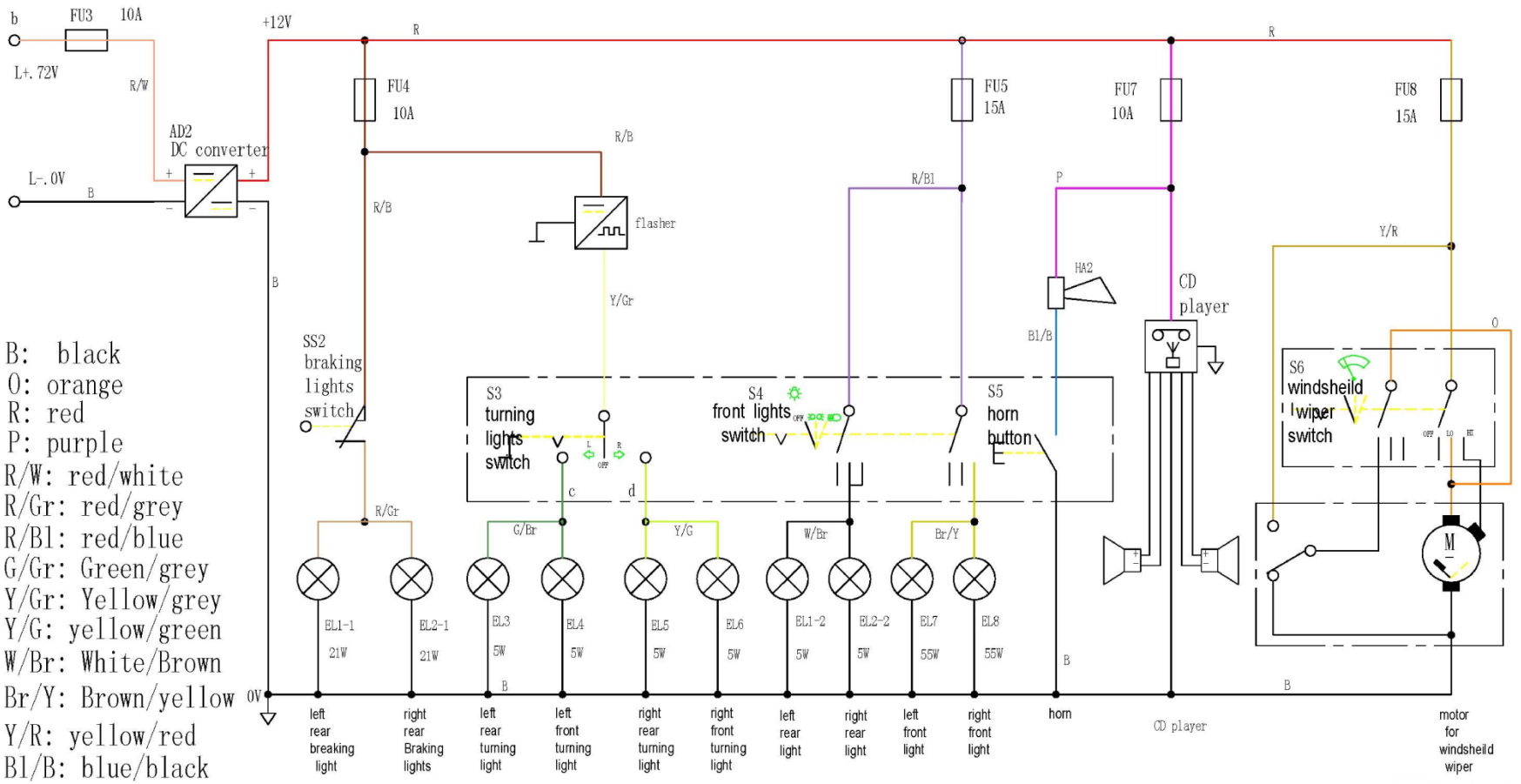
Apply the screw from the backrest to the seat itself.

Side Mirror Assembly

Brake Hose Assembly

Insert the brake hose in the correct position and fix them stable, then screw it safely.


0-5K
THROTTLE POT
MOTOR
TEMPERATURE
SENSOR
PEDAL SWITCH
REV
FWD
GROUND
THROTTLE POT LOW
THROTTLE POT WIPER
Pin7
Pin8
Pin18
Pin16
Pin9
Pin33
Pin22
1238 CONTROLLER
B-
Pin7
Pin32
Pin31
Pin26
W
V
U
B+
Pin6
Pin13
Pin1
GROUND
PHASE B
PHASE A
+5V
DRIVER
COIL RETURN
KSI
POSITION
ENCODER
AC
MOTOR
MAIN
MAIN CONTACTOR
FU1
KEY-SWITCH
Charge SWITCH
OFF
ON
FU2
L-.0
L+.72
BATTERY


b
FU3
10A
L+. 72V
R/W
+12V
R
FU4
10A
AD2
DC converter
L-. 0V
B
R/B
flasher
Y/Gr
FU5
15A
R/Bl
FU7
10A
P
FU8
15A
HA2
Bl/B
CD
player
Y/R
O
SS2
braking
lights
switch
S3
turning
lights
switch
S4
front lights
switch
S5
horn
button
S6
windsheild
wiper
switch
B: black
O: orange
R: red
P: purple
R/W: red/white
R/Gr: red/grey
R/Bl: red/blue
G/Gr: Green/grey
Y/Gr: Yellow/grey
Y/G: yellow/green
W/Br: White/Brown
Br/Y: Brown/yellow
Y/R: yellow/red
Bl/B: blue/black
0V
R/Gr
G/Br
Y/G
W/Br
Br/Y
EL1-1
21W
EL2-1
21W
EL3
5W
EL4
5W
EL5
5W
EL6
5W
EL1-2
5W
EL2-2
5W
EL7
55W
EL8
55W
left
rear
breaking
light
right
rear
Braking
lights
left
rear
turning
light
left
front
turning
light
right
rear
turning
light
right
front
turning
light
left
rear
light
right
rear
light
left
front
light
right
front
light
horn
CD player
motor
for
windsheild
wiper
M